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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/624,078	07/24/2000	Goran Hageltorn	98764-U.S.	5385

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EXAMINER

MILLER, BRANDON J

ART UNIT	PAPER NUMBER
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2683

DATE MAILED: 10/10/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/624,078

Applicant(s)

HAGELTORN ET AL.

Examiner

Brandon J Miller

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6 and 8-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6 and 8-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3-6 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boch in view of Wildey.

Regarding claims 1 Boch teaches improving spectrum deployment in a cellular wireless communications system having multiple adjacent cells, which provide service to a geographic area (see col. 4, lines 58-67). Boch teaches a cell being divided into an even number of at least four cells (see col. 3, lines 56-61). Boch teaches each cell having a base station with a sectorized antenna for bi-directional communication with customer premise equipment located in sectors of a cell, the base stations in adjacent cells being arranged in a grid configuration (see col. 3, lines 60-67 and col. 4, lines 7-20 & 59-65). Boch teaches selecting at least one frequency set for upstream and downstream communication between the base stations and customer premise equipment (see col. 4, lines 7-20). Boch teaches employing polarization diversity between communications in adjacent sectors and reducing interference zones between adjacent sectors in a multi-cell configuration (see col. 3, lines 39-55, col. 4, lines 10-20 & 24-38 and FIG. 5). Boch does not specifically teach using a combination of polarization diversity and rotating sectors to reduce the number of interference zones between adjacent sectors, or rotating the sectors in each

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cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle. Wildey teaches using rotating sectors to reduce the number of interference zones between adjacent sectors (see abstract and pg. 6, lines 46-55). Wildey teaches rotating the sectors in a cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle (see abstract and pg. 6, lines 23-28 & 46-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Boch adapt to include using a combination of polarization diversity and rotating sectors to reduce the number of interference zones between adjacent sectors, and rotating the sectors in each cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle because this would allow for minimized interference at a point which lies in line with and beyond adjacent sites in a network.

Regarding claim 3 Widley teaches a configurable angle that is in the range ± 17.5 degrees to ± 27.5 degrees (see abstract and pg. 6, lines 23-28 & 46-52).

Regarding claim 4 Boch and Widley teaches a device as recited in claim 3 except for an angle that is ± 22.5 degrees. Widly teaches a configurable angle that is in the range ± 17.5 degrees to ± 27.5 degrees (see abstract and pg. 6, lines 23-28 & 46-52). Even though Boch and Widley do not teach a configurable angle that is specifically ± 27.5 degrees it would have been obvious to one of ordinary skill in the art to rotate the angle to a desired specification because this would allow for the possibility of improved signal coverage of a plurality of reception areas in terms of the degree of interference.

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Regarding claim 5 Boch teaches four cells arranged in a two by two grid configuration (see abstract and pg. 6, lines 23-28 & 46-52). Widly teaches a configurable angle that is in the range ± 17.5 degrees to ± 27.5 degrees (see abstract and pg. 6, lines 23-28 & 46-52).

Regarding claim 6 Boch and Widly teach a device as recited in claim 1 except for nine cells arranged in a three-grid configuration. Boch teaches four cells arranged in a two by two grid configuration (see pg. 6, lines 23-28 & 46-52 and pg. 5, lines 58-62). Even though Boch and Widley do not teach specifically teach nine cells arranged in a three grid configuration either reference would work equally as well regardless of the number of cells arranged in the grid configuration and it would have been obvious to one of ordinary skill in the art to adjust cell arrangement to a desired specification because this would allow for a projected coverage plan that can accommodate the requirement for spectral efficiency within a given coverage area.

Regarding claim 12 Boch teaches a system for improving frequency spectrum deployment in a cellular wireless communications system having multiple adjacent cells to provide communications service to a geographic area (see col. 4, lines 58-67). Boch teaches a cell being divided into an even number of at least four cells (see col. 3, lines 56-61). Boch teaches each cell having a base station with a sectored antenna for bi-directional communication with customer premise equipment located in sectors of a cell, the base stations in adjacent cells being arranged in a grid configuration (see col. 3, lines 60-67 and col. 4, lines 7-20 & 59-65). Boch teaches a directional antenna at each CPE for receiving downstream communication from a base station and transmitting upstream communication to a base station to select at least one frequency set for upstream and downstream communication between the base stations and customer premise equipment (see col. 4, lines 7-20 & 39-57). Boch teaches employing

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polarization diversity between communications in adjacent sectors and reducing interference zones between adjacent sectors in a multi-cell configuration (see col. 3, lines 39-55, col. 4, lines 10-20 & 24-38 and FIG. 5). Boch does not specifically teach using a combination of polarization diversity and cell configuration to reduce the number of interference zones between adjacent sectors, or configuring the sectors in each cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle. Wildey teaches using rotating sectors to reduce the number of interference zones between adjacent sectors (see abstract and pg. 6, lines 46-55). Wildey teaches configuring the sectors in a cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle (see abstract and pg. 6, lines 23-28 & 46-52). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Boch adapt to include using a combination of polarization diversity and cell configuration to reduce the number of interference zones between adjacent sectors, and configuring the sectors in each cell such that dividing lines between sectors are offset relative to the grid configuration by a configurable angle because this would allow for minimized interference at a point which lies in line with and beyond adjacent sites in a network.

Regarding claim 13 Boch and Widley teach a device as recited in claim 4 and is rejected given the same reasoning as above.

Regarding claim 14 Boch and Widley teach a device as recited in claim 2 and is rejected given the same reasoning as above.

Regarding claim 15 Boch and Widley teach a device as recited in claim 5 and is rejected given the same reasoning as above.

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Regarding claim 16 Boch teaches polarization in one direction of a grid configuration that alternates between vertical polarization and horizontal polarization (see col. 3, lines 30-38 & 44-55)

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boch in view of Wildey and Florea.

Regarding claim 8 Boch and Widley teach a device as recited in claim 6 except a separate frequency set that is used to provide service to one or more interference zones. Florea teaches a separate frequency set that is used to provide service to one or more interference zones (see col. 7, lines 45-50 & 59-62). It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the Boch and Widley adapt to include a separate frequency set that is used to provide service to one or more interference zones because this would allow for determination of improved signal coverage of a plurality of reception areas in terms of the degree of interference.

Regarding claim 9 Florea teaches providing inadequate coverage to one or more interference slivers (see col. 13, lines 10-12).

Regarding claim 10 Boch and Widley teach a device as recited in claim 6 and is rejected given the same reasoning as above.

Regarding claim 11 Widley teaches multiple clusters of four by four grid configurations (see pg. 8, lines 7-11 and Fig. 5).

Response to Arguments

Applicant's arguments filed 8/06/2003 have been fully considered but they are not persuasive. Regarding independent claims 1 and 12 Boch teaches employing a polarization

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diversity scheme and providing isolation between adjacent sectors in bi-directional communication mode (see col. 3, lines 39-55, col. 4, lines 10-20 & 24-38 and FIG. 5), this relates to applicant's polarization diversity scheme that reduces the number of interference zones between adjacent sectors. Wildey teaches using rotating sectors to reduce the number of interference zones between adjacent cells (see abstract and pg. 6, lines 46-55), this relates to applicant's sector rotation and cell configuration that reduces the number of interference zones.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the combination of Boch and Wildey teach applicants claimed combination of a polarization diversity scheme and rotating sectors that reduce the number of interference zones between adjacent sectors and applicant's claimed combination of a polarization diversity scheme and cell configuration that reduce the number of interference zones between adjacent sectors. Boch and Wildey are combinable in that they both relate to improving frequency spectrum deployment and reducing interference between adjacent sectors.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dipiazza U.S. Patent Application 6,141,557 discloses LMDS system having cell-site diversity and adaptability.

Bossard U.S. Patent Application 5,668,610 discloses a LMDS transmitter array with polarization-diversity sub-cells.

Dixon U.S. Patent Application 6,275,704 discloses a multiple access communication system with polarized antennas.

Roark U.S. Patent Application 6,404,751 discloses a common control channel dynamic frequency assignment method and protocol.

Boch U.S. Patent Application 6,205,337 discloses use of sectorized polarization diversity as a means of increasing capacity in cellular wireless systems.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon J Miller whose telephone number is 703-305-4222. The examiner can normally be reached on Mon.-Fri. 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

October 7, 2003



WILLIAM TROST
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600